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# Three New Species of *Symplocos* (Symplocaceae) from Panama and Costa Rica

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**ABSTRACT.** Three species of *Symplocos* are newly described from Panama and Costa Rica. *Symplocos morii* Almeda & L. Kelly, known from high-elevation western Panama, is distinguished by coriaceous leaves with entire and revolute margins, short, glabrous styles, and white fruits. *Symplocos naniflora* L. Kelly & Almeda is a low-elevation Costa Rican species with serrate leaf margins, small flowers, densely villous styles, and small fruits. *Symplocos elliptica* L. Kelly & Almeda, known from Cerro Hornito and Cerro Sapo, Panama, is distinguished by broadly elliptic leaves with crenate-denticulate margins and solitary flowers. All three species are likely members of *Symplocos* sect. *Symplocastrum* Brand based on their basally connate stamens that are adnate to the petals.

**Key words:** Costa Rica, Panama, Symplocaceae, *Symplocos*.

*Symplocos* Jacquin consists of 250–300 species distributed through tropical and subtropical regions of America, southern and eastern Asia, Australia, and the East Indies. Selected species are also found in temperate latitudes in the Northern Hemisphere. Not surprisingly, many species of *Symplocos* have been described in the century since Brand's (1901) useful but now outdated monograph of the genus. In the course of studies of *Symplocos* for the *Flora Mesoamericana*, three new species were discovered from Costa Rica and Panama. Two of these species were collected from windswept, dwarf cloud-forest vegetation near Cerro Hornito (Cerro Pata de Macho), Panama.

**1. *Symplocos elliptica*** L. Kelly & Almeda, sp. nov. TYPE: Panama. Chiriquí: Cerro Pata de Macho [Cerro Hornito], windswept ridge, 2100 m, 17 Jan. 1986, G. de Nevers & G. McPherson 6842 (holotype, CAS; isotypes, BM, MEXU, MO, PMA). Figure 1.

Arbor 2–3(–20) m alta, ramis junioribus sparsissime sericeis. Laminae foliorum 5.5–8.5 cm longae, 3–4.3 cm latae, coriaceae, ellipticae, margine denticulato-crenatae, basi obtusae, apice acuminatae, adultae supra glabrae, subtus glabratae vel sparsissime strigillosae; petiolus 10–12 mm longus. Flores pedicellati in foliorum axillis solitarii, bracteolis ovatis vel deltoideis, 1–2 mm longis, 1–1.5 mm latis, pedicello 7–10 mm longo; calycis tubus glaber, lobis semicircularibus, ciliatis, 1–1.5 mm longis, 1–2 mm latis; corolla rosea, campanulata, 7–9 mm longa, glabra, lobis oblongis vel obovatis, 3–4 mm latis; stamina multiseriata; stylus pilosus ad basim, 4–5 mm longus. Fructus glaber, ellipsoideus, 1 cm longus, 5 mm latus, 4-locularis.

Small trees 2–3(–20) m tall; vegetative buds and juvenile branches sparsely sericeous, the hairs 0.25–0.5 mm long, translucent brown. Petioles sparsely strigose abaxially, 10–12 mm long and ca. 1 mm wide. Leaves coriaceous, broadly elliptic, 5.5–8.5 × 3–4.3 cm, margins crenate-denticulate with minute, black, deciduous teeth, apex acuminate, base obtuse, abaxially sparsely strigose to glabrescent on the elevated network of veins, adaxially glabrous with the midvein impressed. Flowers axillary, solitary; pedicels terete, 7–10 mm long, sparsely sericeous to glabrate; bracteoles 3 or 4, closely subtending the base of the flower, sessile, caducous, ovate to triangular-ovate, 1–2 × 1–1.5 mm, apex acute to obtuse, abaxially minutely sericeous to glabrous, adaxially glabrous, margins ciliate. Calyx 5-lobed, the lobes subrotund, 1–1.5 mm long, 1–2 mm wide at the base, glabrous, margins ciliate and also commonly bearing brown, vesicular glands. Corolla sympetalous, glabrous, campanulate, 7–9 mm long, 5-lobed, pink; lobes connate basally for 2–3 mm and adnate to the filaments for 3–4 mm at the base, oblong to obovate, apically rounded, 3–4 mm wide, entire to minutely ciliate distally. Stamens 4-seriate; filaments connate basally for 5–6 mm, the free portions of outermost filaments linear-oblong, 2.5–3.5 × 0.75–0.9 mm. Ovary inferior, villous at the summit, glabrous on



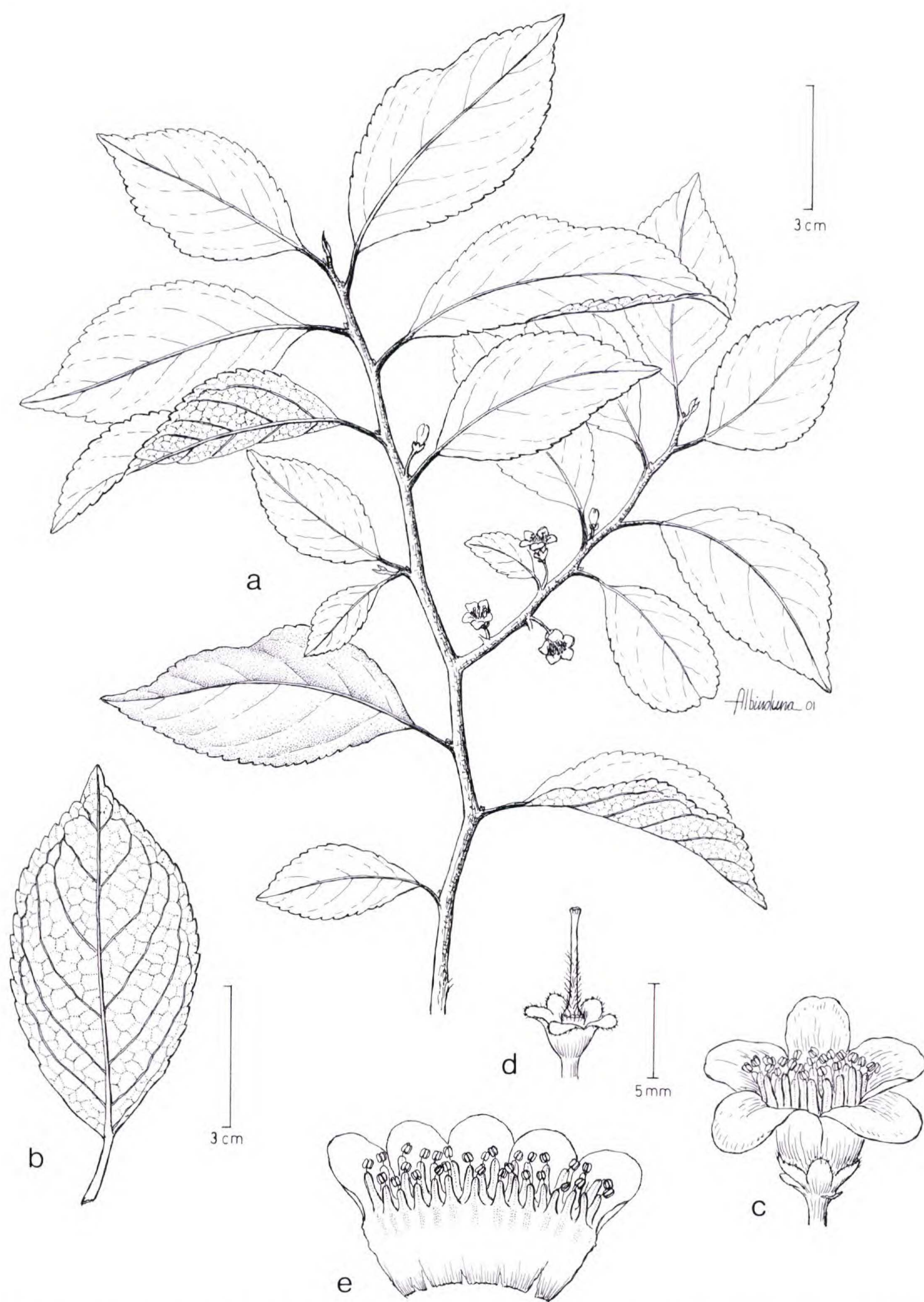


Figure 1. *Symplocos elliptica* L. Kelly & Almeda. —a. Branch with flowers. —b. Leaf, abaxial surface. —c. Flower. —d. Style. —e. Stamens and petals. Based on isotype de Nevers & McPherson 6842 (MEXU).



the sides; style straight, pilose basally, 4–5 mm long; stigma conspicuously but irregularly lobed. Fruits drupaceous, glabrous, ellipsoid, ca.  $1 \times 0.5$  cm, 4-celled in cross section with a rounded bony endocarp.

Known from Cerro Hornito and Cerro Sapo, Panama. The growth form of this species appears to be highly variable in different habitats. The collections from Cerro Hornito indicate that it reaches 2–3 m as a component of windswept dwarf vegetation. The collection from the summit of Cerro Sapo was reportedly a large tree of 20 m.

The combination of broadly elliptic leaves with crenate-denticulate margins and an acuminate apex, solitary flowers, and basally pilose styles distinguishes *Symplocos elliptica* from all other Central American species. The species is likely a member of *Symplocos* sect. *Symplocastrum* Brand based on its basally connate stamens that are adnate to the corolla tube. Based on its solitary, 3- or 4-bracteolate flowers this species is somewhat similar to *Symplocos tribracteolata* Almeda, a recently described Costa Rican species; however, *S. elliptica* differs by the size and shape of its leaves and the basally pubescent style. Leaves of *S. tribracteolata* are elliptic to elliptic-lanceolate and 1.1–2.1 cm wide, whereas those of *S. elliptica* are broadly elliptic and 3–4.3 cm wide. Texture and venation of the leaves of *S. elliptica* suggest that this species may be related to *S. limoncillo* Humboldt & Bonpland, which occurs from Mexico (Veracruz and Chiapas) to Panama. Both *S. limoncillo* and *S. elliptica* have coriaceous leaves with an elaborate network of protruding higher-order veins on the undersurface. Nevertheless the solitary flowers and small fruits of *S. elliptica* serve to clearly separate this species from *S. limoncillo* (which has racemose inflorescences and fruits 1.5–1.8 cm long).

**Paratypes.** PANAMA. **Bocas del Toro:** NW ridge of Cerro Pata de Macho [Cerro Hornito] from summit to Finca Serrano, 1200–2100 m, 27 May 1981, K. Sytsma et al. 4958 (CAS, MO). **Darién:** NE slope of Summit Cerro Sapo, approach from Garachiné, 3300 ft., 8 May 1979, B. Hammel 7269 (CAS, MO).

## 2. *Symplocos morii* Almeda & L. Kelly, sp. nov.

TYPE: Panama. Chiriquí: Cerro Hornito (Cerro Pata de Macho), S rim of the Edwin Fabrega Dam and Reserve watershed, ridge trail leading to the summit, 1800–1950 m, 17 Jan. 1989, F. Almeda et al. 6267 (holotype, CAS; isotype, PMA). Figure 2.

Frutex vel arbor parva 2–5 m alta, ramis vegetativis glabris. Laminae foliorum 5.5–8(–9) cm longae, 3–5 cm latae, coriaceae, late ellipticae, margine integrae, basi ob-

tusae vel rotundatae, apice rotundatae vel breviter obtusato-acuminatae, adultae supra subtusque glabrae, subtus glabris; petiolus 2–7 mm longus. Inflorescentia axillaris, racemosa, 5–7 mm longa, glabra, bracteis bracteolisque ovatis vel oblongis, 1–3 mm longis, 1.5–3 mm latis; calycis tubus glaber, lobis rotundis, ciliatis, 1.3–1.7 mm longis, 1.8–2.2 mm latis; corolla alba, campanulata, 5–6 mm longa, glabra, lobis oblongis, 2.8–3.2 mm latis; stamina fere libera ad basim; stylus glaber, 2 mm longus. Fructus glaber, ovoideus vel ellipsoideus, 6–8 mm longus, 4–5 mm latus, 3-locularis.

Shrubs or small trees 2–5 m tall. Vegetative buds, juvenile branches, and inflorescences glabrous. Petioles glabrous, 2–7 mm long and 2–2.5 mm wide. Leaves coriaceous, entire and revolute along the margins, broadly elliptic,  $5.5\text{--}8(9) \times 3\text{--}5$  cm, apex rounded to very shortly blunt-acuminate, base obtuse to rounded (rarely acute), glabrous. Inflorescences short, axillary, bracteate racemes 5–7 mm long with 3 to 5 subsessile to short-pedicellate (pedicels 0–2 mm long) flowers exceeded by subtending leaves; bracts and bracteoles sessile, persistent, ovate to oblong,  $1\text{--}3 \times 1.5\text{--}3$  mm, glabrous, margins ciliate. Calyx 5-lobed, the lobes very broadly ovate, 1.3–1.7 mm long, 1.8–2.2 mm wide at the base, glabrous, margins ciliate. Corolla sympetalous, glabrous,  $\pm$  campanulate at anthesis, 5–6 mm long, 5-lobed, white; lobes connate basally for 1.5–1.8 mm and adnate to the filaments for 2–2.2 mm, oblong, apically rounded and involute distally, 2.8–3.2 mm wide, margins entire to minutely erose. Stamens  $\pm$  triseriate; filaments connate basally for 2–3 mm, the free portions of outermost filaments linear-oblong,  $2\text{--}2.5 \times 0.5\text{--}0.75$  mm; anthers minutely papillose, bilocular,  $\pm$  globose, 0.4–0.6 mm long and wide. Ovary inferior, glabrous on the sides, the apex villous but glabrescent in fruit; style straight, ca. 2 mm long, glabrous; stigma conspicuously but irregularly lobed. Fruits drupaceous, white, glabrous, ovoid to ellipsoid,  $6\text{--}8 \times 4\text{--}5$  mm, 3-celled in cross section with an irregularly undulate bony endocarp.

This species is known from Bocas del Toro, Chiriquí, and Veraguas Provinces, Panama, where it occurs in exposed, windswept sites at high elevation with dwarf cloud-forest vegetation that forms a 3–5 m canopy. Common associates, noted in the Mori and Bolten collection, include *Quercus* spp., *Podocarpus*, and *Drimys*.

*Symplocos morii* is readily distinguished from all other Central American species of *Symplocos* by its broadly elliptic, entire- and revolute-margined leaves that are 3–5 cm wide, glabrous styles ca. 2 mm long, and fruits that are white when mature. The species appears to be a member of *Symplocos* sect. *Symplocastrum* and is somewhat similar to



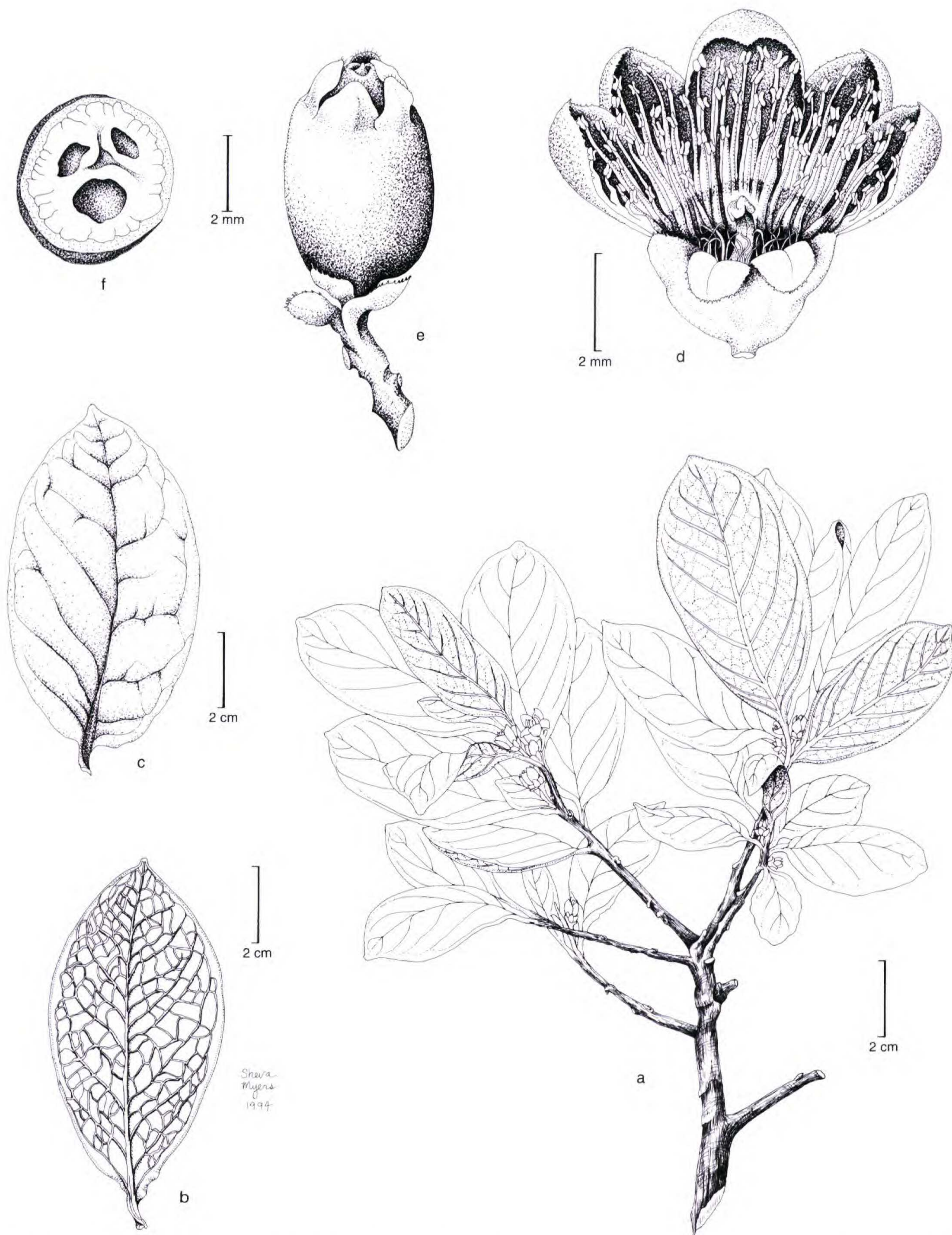


Figure 2. *Symplocos morii* Almeda & L. Kelly. —a. Branch with flowers. —b. Leaf, abaxial surface. —c. Leaf, adaxial surface. —d. Flower. —e. Fruit. —f. Fruit, cross section. Based on the holotype, *Almeda et al.* 6267 (CAS).

*Symplocos costaricana* Hemsley, another predominantly glabrous, entire-margined species that occurs at low elevations throughout Central America. *Symplocos costaricana* can nevertheless be distinguished from *S. morii* based on its flat (non-revo-

lute), narrower leaves (2–3.5 cm wide), longer styles (7–8 mm long), and blue-green fruits.

It is our pleasure to name this species in honor of Scott Mori (b. 1941), an expert in the Neotropical flora at The New York Botanical Garden, in rec-



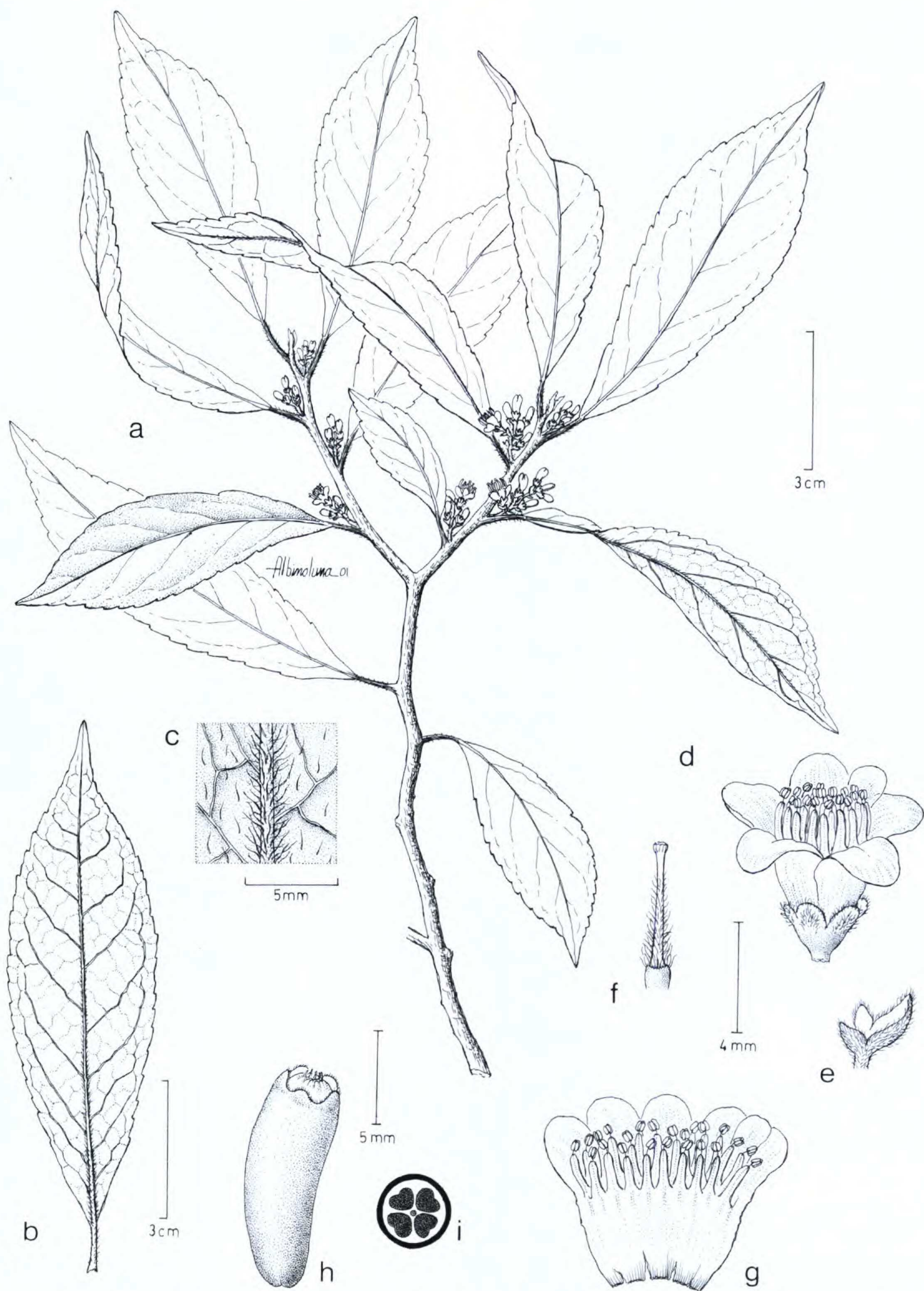


Figure 3. *Symplocos naniflora* L. Kelly & Almeda. —a. Branch with flowers. —b. Leaf, abaxial surface. —c. Leaf pubescence, abaxial surface. —d. Flower. —e. Bracteoles. —f. Style. —g. Stamens and petals. —h. Fruit. —i. Fruit, cross section. Based on isotype *Herrera 4677* (MEXU).



ognition of his outstanding contributions to botanical research.

*Paratypes.* PANAMA. **Bocas del Toro:** on Chiriquí trail, Elfin Forest at Divide, 20 Apr. 1968, *J. H. Kirkbride & J. A. Duke* 992 (MO, NY). **Chiriquí:** path from Linares Farm ca. 1400 m to top of Cerro Hornito at 1750 m, 27 Dec. 1977, *J. P. Folsom et al.* 7240 (CAS 2 sheets, MO); Cerro Hornito, 40 km NW of Gualaca, 2238 m, 27 July 1975, *S. Mori & A. Bolten* 7502 (CAS, MEXU, MO). **Veraguas:** summit of Cerro Tute above Escuela Agrícola Alto de Piedra, just W of Santa Fé, 1350–1410 m, 8°32'N, 81°07'W, 5 June 1982, *S. Knapp & R. Dressler* 5396 (CAS, MEXU, MO).

**3. *Symplocos naniflora* L. Kelly & Almeda, sp. nov.** TYPE: Costa Rica. Puntarenas: Cantón del Golfito Jiménez, between Quebrada Pate-mazo and the headwaters of Río Madrigal, 650 m, 30 Nov. 1990, *G. Herrera* 4677 (holotype, CAS; isotypes, CR, F, MEXU, MO, NY). Figure 3.

Arbor 13–20 m alta, ramis junioribus pilosis. Laminae foliorum 6.5–11(–12.5) cm longae, 2.5–3.5(–4.4) cm latae, membranaceae, oblanceolatae, margine serrulatae, basi acutae, apice acuminatae, adultae supra glabrae, subtus pilosae; petiolus 4–8 mm longus. Inflorescentia axillaris, racemosa, 5–10 mm longa, sericea, bracteis bracteolisque ovatis vel subrotundis, 1–1.5 mm longis, 1–1.5 mm latis; calycis tubus sericeus vel glabratus, lobis triangularibus vel semicircularibus, ciliatis, 1–1.5 mm longis, 1–1.5 mm latis; corolla alba, campanulata, 4–6 mm longa, glabra, lobis oblongis, 2–2.5 mm latis; stamina multiseriata; stylus pilosus, 4–6 mm longus. Fructus glaber, ellipsoideus, 1–1.2 cm longus, 4–5 mm latus, 4-locularis.

Trees 13–20 m tall; vegetative buds and juvenile branches moderately to sparsely pilose, the hairs 1–1.5 mm long, soft, brown, spreading to erect. Petioles pilose to glabrate, 4–8 mm long and ca. 1 mm wide. Leaves membranaceous, serrulate, oblanceolate rarely varying to elliptic, 6.5–11(–12.5) × 2.5–3.5(–4.4) cm, apex acuminate, base acute (often narrowly so), abaxially pilose, densely so on the protruding midvein, adaxially glabrous. Inflorescences short, axillary, bracteate racemes 5–10 mm long with 3 to 6 sessile to short-pedicellate (pedicels 0–3 mm long) flowers; rachis sparsely to densely sericeous; bracts and bracteoles sessile, persistent, ovate to subrotund, 1–1.5 × 1–1.5 mm, abaxially glabrate to densely sericeous, adaxially glabrous, margins ciliate. Calyx 5-lobed, the lobes triangular-ovate to subrotund, 1–1.5 mm long, 1–1.5 mm wide at the base, abaxially sparsely sericeous to glabrate, adaxially glabrous, margins ciliate. Corolla sympetalous, glabrous, cylindric-campanulate at anthesis, 4–6 mm long, 5- or 6-

lobed, white; lobes connate basally for 1.5–2.5 mm and adnate to the filaments for 2–3 mm at the base, oblong, apically rounded, 2–2.5 mm wide, entire to minutely ciliate distally. Stamens 3- or 4-seriate; filaments connate basally for 3–5 mm, the free portions of outermost filaments linear-oblong, 2–3 × 0.25–0.5 mm. Ovary densely villous at the summit, glabrous on the sides; style straight, 4–6 mm long, middle and lower part densely villous; stigma inconspicuously and irregularly lobed. Fruits drupaceous, glabrous, ellipsoid, 1–1.2 × 0.4–0.5 cm, 4-celled in cross section with a rounded to very slightly undulate bony endocarp.

This species is distinguished based on the following combination of characters: membranaceous leaves, small flowers with densely villous styles, and small fruits. It is likely a member of *Symplocos* sect. *Symplocastrum* and may be closely related to *S. bicolor* L. O. Williams, another low-elevation, small-fruited species of the section. *Symplocos bicolor* is distributed from Chiapas to Nicaragua and is distinguished from *S. naniflora* based on its glabrous leaves and styles, larger flowers (corolla 6–7 mm long), and 5-lobed corolla.

*Paratypes.* COSTA RICA. **Alajuela:** Cantón de Los Chiles, Caño Negro, Las Cubas, Cuenca del Río Frío, 35 m, 11 Oct. 1996, *A. Rodríguez* 1653 (F); Cantón de San Carlos, llanura de San Carlos, finca aserradero San Jorge, 100 m, 21 Jan. 1996, *N. Zamora & A. Zeledón* 2368 (MEXU, MO). **Puntarenas:** Reserva Forestal Golfo Dulce, entre Rancho Quemado y Drake, 300 m, 29 Mar. 1991, *R. Aguilar et al.* 105 (MEXU, MO); Cantón de Osa, R.F. Golfo Dulce, Península de Osa, Los Mogos, 200 m, 5 July 1994, *R. Aguilar* 3462 (MO); Cantón del Golfito, Valle de Coto Colorado, camino a las torres del ICE, cabecera del Río Sorpresa, 5 km al este, 300–400 m, 1 Feb. 1992, *N. Zamora et al.* 1748 (F, MO); Cantón del Golfito, Valle de Coto Colorado, camino a las torres del ICE, cabecera del Río Sorpresa, 5 km al este, 300–400 m, 22 Jan. 1993, *N. Zamora et al.* 1924 (F, MO, NY). **San Jose:** basin of El General, 675–900 m, 12 Dec. 1977, *A. F. Skutch* 5523 (F 2 sheets).

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#### Literature Cited

Brand, A. 1901. Symplocaceae. Das Pflanzenreich IV. 242 (Heft 6): 1–100.